

2019

Part – II

INDUSTRIAL FISH AND FISHERIES

(Major)

Paper – III

Full Marks – 90

Time : 4 Hours

*The figures in the right-hand margin indicate marks.
Candidates are required to give their answers in
their own words as far as practicable.*

Illustrate the answers wherever necessary.

Fish and shellfish Nutrition and Biochemistry

1. Answer any **ten** questions from the following :
2×10=20
 - (a) Write the storage form of carbohydrate in fish cite its synthesis and site of storage.
 - (b) What are feed preservatives ?
 - (c) State the criteria of quality fish seed.
 - (d) What do you mean by FCR and FCE ?

- (e) What is Gonadu-Somatic Index ? State its significance.
- (f) Explain the importance of natural food during larval development.
- (g) What do you mean by Frameshift mutations ?
- (h) State the usefulness of floating feed.
- (i) Write the name of hormones used for sex reversal in fish.
- (j) Write a short note on linked genes.
- (k) Define periphyton with two examples.
- (l) State the importance of cryoprotectant.
- (m) Name the anaesthetics used during fish transportation.
- (n) What do you mean by homoplastic and heteroplastic hypophysation ?
- (o) Write short note on antinutritional factor.

GROUP – A

(Fish and shell fish Nutrition & Biochemistry)

2. Answer any **two** of the following : $10 \times 2 = 20$
- (a) (i) Define lipids and classify with suitable examples. 1+2

(ii) What is essential fatty acids ? Explain with examples. 2

(iii) Define polysaccharides with examples. 5

(b) (i) What do you mean by ration size and feeding frequency ?

(ii) Briefly discuss on growth promoters and feed preservative. (4+6)

(c) (i) Define enzymes.

(ii) Classify enzymes with suitable examples.

(iii) Explain the factors that affects enzyme activity. (1+5+4)

(d) (i) Write a note on micro-algae culture.

(ii) Briefly explain the process of tubifex culture.

(iii) What is non-convention feed ingredients ? Add a note on feed storage. (3+3+4)

3. Answer any **one** of the following : 15×1=15

(a) Write short note

(i) *Growth promoter and chemo attractant.*

- (ii) Micro-encapsulated feed and importance.
- (iii) Energetics of β -oxidation. (5+5+5)
- (b) (i) Define live food and supplementary food.
- (ii) Enlist different fish feed ingredients used in fish feed formulation.
- (iii) Briefly discuss on factors affecting quality standards of feed.
- (iv) Add a note on pigments present in feed ingredients. (3+4+5+3)

GROUP – B

(Fish genetics and Hatchery Technology)

4. Answer any **two** from the following. $10 \times 2 = 20$

- (a) (i) Define gene.
- (ii) Write a note on gene mutation.
- (iii) Briefly discuss on the procedure of production of sterile fish and their importance in aquaculture.

(1+3+4+2)=10

- (b) (i) Write a note on bunch breeding.

(ii) Briefly discuss the fish seed transpiration.

(iii) State the importance of quarantine of imparted seed. $(4+3+3)=10$

(c) Write note on : $2\frac{1}{2} \times 4$

(i) Transgenic Fish

(ii) Importance of brood banks

(iii) Multiple breeding

(iv) Monosex fish culture

(d) (i) What is induced breeding ?

(ii) Describe the process of hypophysation technique. Mention the limitation of hypophysation.

(iii) Mention different hormones secreted from adenohiphysis. $(1+4+2+3)$

5. Answer any **one** of the following : $15 \times 1 = 15$

(a) (i) What is extender ?

(ii) Describe the procedures for the cryopreservation of fish spermatozoa.

(iii) Write note on relative fecundity of fish.

(iv) Briefly describe annual reproductive *cycle of Indian major carps.*

$(2+6+2+5)=15$

- (b) (i) Define genome.
- (ii) Briefly discuss induced gynogenesis with suitable example.
- (iii) Write a note on pheromones in fish.
- (iv) Briefly describe hybridization in fish with suitable examples.

(2+5+3+5)=15
